

CLAIMS

What is claimed is:

- 1        1.        A method for improving an input match in a circuit comprising:
  - 2                    operating a cascode having an input signal port with an input signal
  - 3                    impedance and further having a stage gain controlled by a level setting gain
  - 4                    control voltage;
  - 5                    and
  - 6                    operating an impedance compensating circuit for changing a compensating
  - 7                    impedance presented at the input signal port,
  - 8                    wherein the impedance compensating circuit is controlled by
  - 9                    the level setting gain control voltage and wherein the impedance
  - 10                    compensating circuit is operable to counteract changes in the input
  - 11                    signal impedance correlated with changes in the stage gain.
- 1        2.        The method of claim 1 wherein:
  - 2                    the impedance compensating circuit is connected in parallel with the
  - 3                    input signal port.
- 1        3.        The method of claim 1 wherein:
  - 2                    the impedance compensating circuit is connected in series with the
  - 3                    input signal port.
- 1        4.        The method of claim 1 wherein:
  - 2                    the impedance compensating circuit is connected in series-parallel with
  - 3                    the input signal port.
- 1        5.        The method of claim 1 wherein:
  - 2                    the cascode is implemented using Gallium Arsenide transistors.

1           6.     The method of claim 1 wherein:  
2                 the cascode is implemented using metal-oxide semiconductor  
3                 transistors formed as an integrated circuit.

1           7.     The method of claim 1 wherein:  
2                 the cascode is implemented using devices selected from a list  
3                 consisting of metal-oxide semiconductor transistors, silicon bipolar transistors  
4                 and germanium transistors.

1           8.     A circuit for processing a signal comprising:  
2                 a cascode having  
3                     a first transistor connected in a configuration selected from a  
4                     group consisting of a common gate configuration and a common base  
5                     configuration  
6                     and  
7                     a second transistor connected in a configuration selected from a  
8                     group consisting of a common source configuration, a common drain  
9                     configuration, a common emitter configuration and a common  
10                    collector configuration;  
11                 a gain controller operable to adjust a gain of the cascode in response to  
12                 a control signal; and  
13                 an impedance controller operable to adjust an input impedance of the  
14                 cascode with a loading impedance in response to the control signal;  
15                 whereby the circuit operates with input impedance  
16                 compensation.

1           9.     The circuit of claim 8 wherein  
2                 the circuit is an amplifier.

1           10.    The circuit of claim 8 wherein

2 the circuit is an amplifier that operates at a narrow band of frequencies  
3 in the microwave region.

1 11. The circuit of claim 8 wherein  
2 the circuit is implemented as a single integrated circuit.

1 12. The circuit of claim 8 wherein  
2 the circuit is implemented using metal-oxide semiconductor  
3 technologies.

1 13. The circuit of claim 8 wherein  
2 the circuit is implemented using Gallium Arsenide technologies.

1 14. The circuit of claim 8 wherein  
2 the impedance controller comprises an inverter.

1 15. The circuit of claim 8 wherein  
2 the gain controller outputs a DC bias voltage that is applied to a control  
3 terminal of the first transistor.

1 16. A circuit for processing a signal comprising:  
2 a cascode having

3 a first transistor connected in a configuration selected from a  
4 group consisting of a common gate configuration and a common base  
5 configuration

6 and

7 a second transistor connected in a configuration selected from a  
8 group consisting of a common source configuration, a common drain  
9 configuration, a common emitter configuration and a common  
10 collector configuration;

11 a controller operable to adjust a gain of the cascode in response to a  
12 control signal and further operable to adjust an input impedance of the cascode  
13 with a loading impedance in response to the control signal;  
14 whereby the circuit operates with input impedance  
15 compensation.

1 17. The circuit of claim 16 wherein  
2 the circuit is an amplifier that operates at a narrow band of frequencies  
3 in the microwave region.

1 18. The circuit of claim 16 wherein  
2 the circuit is implemented as a single integrated circuit.

1 19. The circuit of claim 16 wherein  
2 the circuit is implemented using metal-oxide semiconductor  
3 technologies.

1 20. The circuit of claim 16 wherein  
2 the circuit is implemented using Gallium Arsenide technologies.